

had accompanied his troop to a "night-drill" which was held in the woods above the post. While remaining stationary and awaiting orders his troop commander saw him suddenly leave his position in ranks, and drawing his saber start in a mad gallop for an adjoining hillock in the open. Here he remained for some time, gesticulating wildly and singing at the top of his voice, a weird Arabic song. His commanding officer,—who had lately joined the troop,—desired to place him under arrest and take away his saber; but at the suggestion of one of the older sergeants deferred doing so until he should become more quiet. In the meantime, a sergeant with whom our patient was quite friendly, went to him and told him to go to the stables, put up his horse and equipment and go to bed. This he immediately did, without any show of remonstrance, and the next morning said that he remembered nothing of the occurrence,—save being sleepy while in the woods,—until he found himself undressed and in his own bed, a period of about two hours.

This took place on Thursday evening and on the day following I discussed at length the case with the officer, requesting that the man be sent to me for examination. I recognized, when talking with him and taking his history, the uselessness of drug medication, for this had been tried by the man himself on many occasions.

I concluded that the somnambulistic state was due to the influence of his "subconscious mind" upon a nature particularly susceptible and that if I could obtain the man's confidence I could suggest to him the fact that these attacks were unnecessary. I therefore made arrangements for another interview and believing myself competent to assist him, I placed him in a hypnotic state.

While he was in this condition, I authoritatively told him that these attacks were controllable and that, as a post-hypnotic suggestion, he should report to me 5 days later precisely at 10 a. m. I awoke him from his sleep and was glad to find that he came to my office at exactly the hour I had specified. When I asked why he had reported at the hospital, he could give no definite answer but that he "had an idea that I wished to see him."

Not being satisfied with my first effort and wishing to make a more pronounced effect on his memory, I again placed him in a hypnotic state and while in this condition I suggested that he would revert to that period in his life when the attacks had entirely left him and when for eleven years he was practically cured, insisting that, if he could be relieved for eleven years, the attacks were unnecessary and could be controlled.

I gave him another post-hypnotic suggestion which was again successful. Sufficient time has not elapsed for me to say that my efforts will be ultimately curative but he has had no somnambulistic attacks for several weeks, while before the treatment was instituted they occurred at least every other night.

The man realizes that his usefulness as a soldier depends upon his being entirely relieved of the habit and is working in complete harmony with me in

my endeavors to restore his control over his sleeping state.

Note: About eight months have elapsed since I last treated this soldier, and he ever since has been entirely free from his somnambulism. He informs me that his self-confidence and general health have improved, and that he is positive that he will never again need my services.

REMINISCENCES OF TEN YEARS AS COMMISSIONER OF HEALTH IN CHICAGO, AND SUGGESTIONS FOR THE FUTURE.*

By ARTHUR R. REYNOLDS, M. D., Chicago.

In April, 1893, I was first appointed Commissioner of Health for the City of Chicago, where that official, under the Mayor and City Council, is the supreme sanitary authority.

At that time the sewage of the city emptied either directly into Lake Michigan or into the Chicago River, which in turn emptied into Lake Michigan. The Illinois and Michigan Canal connected with the south branch of the Chicago River at Bridgeport, about two miles from its mouth.

In the early days of the canal there was a light flow from the lake through the Chicago River into the canal, on into the Desplaines River and thence toward the Mississippi River, thus reversing the current of the Chicago River. Large pumps had been installed at Bridgeport and the streams so augmented that for a number of years a flow was maintained from the lake to the canal in ordinary dry weather, but in times of freshet the whole corrupt contents of the river were swept into the lake. The water supply of the city came from the lake. Typhoid fever had been prevalent for years and reached its height in 1891.

It was generally recognized by physicians that something should be done to protect the public from the evil effects of drinking the impure lake water.

The ordinances said it was the duty of the Commissioner of Health to give the Mayor and City Council advice upon all sanitary matters, and without further consultation I sent an official letter to the Mayor and City Council recommending that the capacity of the Bridgeport pumps be at once doubled. To my mind this was the quickest way to safely get rid of the foul sewer water.

The next morning I learned by the newspapers that my communication had created something of a sensation, for we were on the eve of the opening of the great World's Fair. Early in the day I was summoned to the Mayor's office and asked by that official why I had sent a letter to the Council on the water supply. I answered that the people were sick and dying from the effects of drinking the impure water. The Mayor said, "Young man, don't you be so — anxious to find fault with our water supply. I have been drinking the lake water for forty years, and look at me."

That Mayor had more than a National reputation for mental acumen and intellectual attainments; the incident is recited only for the purpose of showing

* Read before the California Public Health Association, San Jose, April, 1909.

the state of public opinion at that time with reference to water-borne diseases.

By interviews published in the daily press and weekly bulletins published by the Department, we pointed out on all possible occasions the danger of the water and recommended that it be either boiled, distilled or filtered before using. The newspapers printed conspicuously our daily analysis of the water and kept for a time standing on the front page the phrase "Boil the water" and in addition, gave the question frequent editorial emphasis. All of which was copied and reprinted in scores of other local publications.

Three or four years later, in order to determine what progress was being made in the campaign of education, a house to house canvas was made in a considerable area of the poorer parts of the city to learn what number of people were using raw, untreated water, and it was found that more than eighty per cent were using either boiled, filtered, distilled, or spring water.

In the year 1899 the Drainage Channel had not yet been opened, the capacity of the Bridgeport pumps had not been increased. The sewers still emptied either directly into the lake or the Chicago River. The mortality rate from typhoid fever had gradually dropped from 24.15 per 10,000 of population to 15.68 per 10,000 of population, a reduction of more than 72 per cent in eight years in the actual number of deaths occurring, notwithstanding an increase in the population of 30 per cent. In other words 1997 people died of typhoid fever in 1891 and 442 in 1899. Had the rate of 1891 continued in 1899 3984 persons would have died that year, leaving a balance of 1987 human lives saved, in one of the nine years in one disease, to the credit of public education.

With no little difficulty we started a Municipal Laboratory and undertook the inspection of milk. When the work began 40 to 50 per cent of the samples of milk collected for examination were found to be below grade. The percentage of samples found below grade soon dropped to 7 or 8. It came into the city by rail in haphazard fashion. The receiving stations and milk depots were untidy and unclean. There were three organizations of milk dealers looking only to the commercial side of their business and all in opposition to the ordinance. These soon came into line and became agencies for a clean and better supply. Stores and shops cleaned up. The railroads appointed agents whose sole duty was to look after the shipping of milk, and whole trains now carry nothing but milk. The most approved methods were gradually installed in many dairies, companies were formed and milk was bottled in the country in a sanitary way and shipped to the city on ice. Dairy Inspectors were later secured and sent into the dairy country to inspect the herds and to teach the dairymen. The dealers found with poor milk were fined from time to time, and occasionally a bad lot was seized and turned into the sewer at the receiving station.

In 1903 we began our efforts for a fresher supply of milk. Most of the milk is produced within 80 miles of the city. There did not seem to be any

good reason why milk obtained at night should not be served for breakfast next morning in the city. To do so would change the time of delivery by the farmers, time of shipment by the railroads, and the method of the city dealer. All our efforts in this direction failed. A fresher supply of milk is as far off as ever, although some do try to deliver twelve hours' old milk and some even six hours' old, but the idea did not seem to take root and all efforts to press it have since ceased.

In 1893 there were 12,363 deaths of children under five years of age (the milk feeding period of child life). In 1905 in spite of the great increase of population, there were only 8512 deaths of children under five years of age.

When the antitoxin treatment for diphtheria was introduced, there was great scepticism with regard to its use and considerable open opposition. The department, as soon as a supply could be obtained, placed it at the disposal of physicians at cost price and began its use. Careful records were kept of the cases treated by the department physicians, and it soon appeared that there were no deaths from diphtheria when the remedy was used on the first day of the disease, and that the ratio of cures diminished with each day's delay till its use on the fifth day or later had little effect. These records were kept with care and at the end of three years the brute force of the figures compelled the universal adoption of antitoxin in the city, and now nowhere in the country is diphtheria a menace if promptly recognized and a proper dosage of antitoxin administered. The total number of deaths from diphtheria in Chicago in 1895, the year antitoxin was introduced, was 1420. The total number of deaths from diphtheria in 1905 was 426.

Boston was the first city in the country to take up the medical inspection of public school children, and Chicago was the second. The work has since spread over the entire country, and is properly regarded as one of the most useful advances, and has become indispensable wherever its value is known.

Smallpox was left us as a heritage from the World's Fair in 1893 and caused 1033 deaths in 1894. Vaccination had long been neglected. Certificates of vaccination were one of the requirements for admission of children to the public schools, but we soon found that physicians were very careless in issuing these certificates. An attempt had been made to vaccinate and the certificates without knowing whether the vaccination had been successful or not in very many cases. Surgical cleanliness in preparing the vaccine and in performing the vaccination had not yet been introduced.

It was well into 1894 before we could get money enough to undertake the vaccination of the entire city. When that was accomplished the danger was over.

An up-to-date hospital for the care and isolation of smallpox was one of the net gains of the epidemic.

At that time the vaccine was sold on bone points. Much of it was inert and there were many infected arms resulting from its use. With the introduction of glycerinated vaccine lymph we broke away from

the use of the harsh and faulty word virus. Every purchase of the new lymph before it was accepted or paid for was tested in the laboratory for the presence of septic organisms, and next was tested clinically by the vaccinators as to its potency. Surgical cleanliness in performing vaccination was insisted upon, all of which is the rule to-day.

A few years later a mild form of smallpox became general in the middle west and was continually being introduced into Chicago. We found it necessary to begin a campaign that would cover the entire area tributary to Chicago.

We called a conference of the officials of all the railroads running into the city and readily secured their aid and co-operation. We published in 1901 what we called the vaccination creed. The railroads printed it conspicuously on cardboard and posted it in most instances in every station on their various systems. We posted it in the city. The creed is still in use, doing good service, and answers substantially every question that may arise with reference to vaccination and its utility and is here repeated:

The Vaccination Creed.

After many years of experience with smallpox and Vaccination, the Chicago Department of Health hereby declares:

First. That true Vaccination—repeated until it no longer “takes”—*always* prevents smallpox. *Nothing else does.*

Second. That true Vaccination—that is, vaccination properly done on a *clean* arm with *pure*, potent lymph and kept perfectly *clean* and *unbroken* afterwards until the scab falls off naturally—never did and *never will* make a serious sore.

Third. That such a Vaccination leaves a characteristic scar, unlike that from any other cause, which is recognizable during life and is the *only* conclusive evidence of a successful Vaccination.

Fourth. That no untoward results ever follow such Vaccination. On the other hand thousands of lives are annually sacrificed through the neglect of vaccination—a neglect begotten of *lack of knowledge*.

The creed and a supplement giving full information of the proper method of vaccination and other data was printed in circular form and distributed widely. The smallpox subsided promptly and vaccination was given such a boost that smallpox will not again for a generation be a menace.

In our smallpox hospital we took classes of students from the various medical schools and taught them to diagnose the disease and to treat it. None of them contracted the disease and none of them carried it to others.

We inaugurated and conducted for the Trustees of the Sanitary Districts a series of chemical and bacteriological examinations of the streams containing the waters of the Drainage Channel before it was opened and for nearly a year afterwards as far as St. Louis, Missouri, in its flow to the Gulf, on a scale never before attempted. The results were compiled and published and were the basis of the defense of the District when later the State of Missouri began action for damage which resulted in

the triumph of the District. It also demonstrated the wisdom of the founders of the Channel system of drainage for Chicago, who claimed that the waters between Chicago and St. Louis would be purified rather than polluted by the large dilution of fresh water from Lake Michigan and by oxidation and sediment as it traversed the 350 miles between. It also will serve as a guide to any part of the country interested in stream purification.

Circulars were prepared upon “The Hot Weather Cure of Infants and Young Children.”

“Restriction and Prevention of Consumptives.”

“Antitoxin Treatment of Diphtheria.”

“Advice to the Family in Cases of Contagious Diseases,” and many other topics. Some of them were printed in eight different languages.

We early learned that public health administration could never be in advance of the medical profession, and that the individual members of the profession as they brought their healing powers to the people, also formed a vast army of men on the firing line, teaching and preaching how disease may be prevented.

Public health service can only use in a public way the knowledge that the individual practitioner uses daily in his rounds. With this thought constantly in mind it was not difficult to have the profession as a unit at our back on all occasions. We succeeded in getting men of brains into our department; we were always happily able to avoid internal dissensions which made it possible to present a solid front to the enemy.

Time does not permit going into further details, nor does it seem necessary for the purpose at hand.

The logical deduction to be drawn from the foregoing is that the public can be educated in health matters by keeping everlastingly at it.

I do not for one moment claim that I did it all—I was but a cog in the wheel of the organization, every man and woman in it did their part, and each was a loyal enthusiast. I was out of office from June, 1895, to April, 1897, but the main structure of the organization was retained and the scientific features of the work continued.

The present Commissioner of Health has greatly extended the scope of the department and the future is bright for Chicago to retain the proud distinction of having the lowest mortality rate of any city of metropolitan proportions in the world.

Before closing, perhaps I may suggest a thought or two with reference to the future.

The protecting power of vaccination and the proper method of vaccination should be better taught in our medical schools.

The family physician should see to it that every child in the families who depend on him is successfully vaccinated and re-vaccinated when they grow up, and should impress also upon parents that it is as much their duty to protect their children from smallpox as to protect them from cold or hunger.

There is a vast army of people more or less vulnerable to diseases because of faulty nutrition. There is the under-nourished dyspeptic and also the over-nourished, both of whom have and usually are vio-

lating common sense both in the selection of the kind and quantity of their diet and in the manner of using it. Here again the family physician must be the principal agent for betterment, for it is often, if not generally, an individual matter.

The conviction has been growing with me that cow's milk is a very much over-estimated article of diet for children. We know it has caused sickness again and again. It has carried to the child almost every known contagious disease as well as the usual enteric diseases, because it is so easily infected and germ life multiplies in it so rapidly. It is a short lived product at best, and every physician has seen bottle-fed babies raised without it. The more I think of it, the more it seems that cow's milk as a diet for a child, instead of being a natural food is quite an unnatural food.

Nature provides that the milk go directly from the mother without change of temperature and sterile into the stomach of the offspring. All cow's milk is contaminated before it reaches the pail of the milker, even under the best conditions. In cities it is from 24 to 48 hours' old and even more before it reaches the child and has become a very different article since it left the udder of the cow.

If physicians skilled in the artificial dieting of infants will give us a substitute, and I feel sure they can, the whole expensive and vexatious question of a city's milk supply will vanish like a dream.

Nature seems to demand that children with teeth should use them upon a solid diet. Indeed mastication is necessary for the proper development of the teeth and the digestive secretions of the mouth. If the child is constantly urged to drink milk it is certain he cannot eat very much else.

It is rather sweeping to recommend the elimination of cow's milk in cities from the diet of children under five years of age, but the still high sickness rate and the still high mortality rate among the little ones is disconcerting and I feel certain that the use of milk is at the bottom of much of the trouble.

Many attempts have been made, especially in the old world, to lessen the terribly evil effects of venereal diseases, but with little gain.

It is my belief that these diseases, with the train of other diseases they cause, could be greatly reduced if not eradicated if the entire public knew as much of the evil they cause as do the medical profession. I further believe it is the duty of the medical profession in their daily practice, in communications to the daily press, by public lectures, and by every means of conveying intelligence, to enlighten the masses and put them on their guard. What education has done to lessen other diseases, it can do for these diseases.

If the temperance wave that is abolishing so many drinking places throughout the country should become universal and do away with the abuse of intoxicating liquors, syphilitic diseases would lose one of their strongest props.

In the State of Indiana a law is in force that authorizes the sterilization of "Confirmed Criminals, idiots, imbeciles and rapists." Eight hundred con-

victs have been sterilized under the law, two hundred of them at their own request.

The very simple operation of vasectomy will deprive a man of his power to procreate without loss of any other power or function. Oregon has recently passed a similar law.

The operation is so simple and safe, it is to be hoped that it will be speedily enacted in all states. Its application might be profitably extended to syphilitics and possibly to those suffering from other diseases that leave a poor health inheritance to offspring.

The practical application of the idea would in time weed out many of the weaklings, doomed to be victims of disease and early death, a menace to peace and a charge upon the public.

BACKACHE.

By C. M. COOPER, M. D., San Francisco.

Backache is a complaint exceedingly common, and the cause of its origin is often difficult to determine. Nevertheless, it receives scant attention in the text books of medicine, and the various encyclopedias.

Many patients so afflicted visit our clinic. Frequently they have been previously treated for months and years for some lesion other than the true one, and it has often seemed that narrow specialism in diagnostic work has left so many borderline gaps as to be responsible for the errors that have been made. This paper is an attempt to present a broad diagnostic scheme which has met with considerable success in the elucidation of the cause of backache in private and clinic patients and which was primarily evolved for teaching purposes.

Running longitudinally through the center of the back is the vertebral column. Wonderfully flexible during life, it is made up of a series of superimposed bones separated and united by intervertebral discs, and a great number of ligaments. Between the processes of these bones, and connecting ribs to vertebrae, and ilia to sacrum are joints of different varieties. Large sheets and strands of muscles and extensive fibrous aponeuroses clothe the bony framework. Hanging within the vertebral canal, surrounded by its membranes, is the spinal cord, and coming off in pairs at various levels are the nerve roots which unite and issue as nerve trunks through comparatively small apertures formed by the vertebral articular processes. The posterior divisions of these nerve trunks mainly innervate the back tissues, and it is in their area of distribution that back pains are commonly located. These posterior primary divisions descend (as do the lateral branches of the anterior primary divisions of the dorsal nerves) some distance before they innervate the overlying integument, and thus it is that the skin zones supplied by the nerve roots or spinal segments run more or less transversely.

At each spinal movement there is a compression of one portion of the intervertebral discs and a stretching of the other; an approximation of the origins and insertions of some ligaments, a separa-